

In the Claims:

Please cancel Claims 2, 6, 42, 43, 48, and 49, and amend Claims 1, 9, 44-47 and 51.

The currently pending and amended claims are below. Please amend the claims following wherein amendment is indicated in parenthesis, wherein the deleted matter is shown by strikethrough, and wherein the added matter is shown by underlining.

1. (Currently amended) An isolated insect polynucleotide that encodes a bHLH-PAS polypeptide that is involved in binding juvenile hormone III, wherein said polynucleotide hybridizes under stringent conditions with a polynucleotide having a nucleotide sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3 and SEQ ID NO:6, wherein said insect is selected from the group consisting of *Coleoptera*, *Siphonoptera*, *Orthoptera*, *Thysanoptera*, *Lepidoptera*, *Hemiptera*, and *Diptera*, and wherein the stringent conditions comprise hybridization in 1xSSC and 0.1% SDS at about 55°C for about 60 minutes.
2. (Cancelled)
3. (Original) An isolated polynucleotide as claimed in claim 1, wherein said polynucleotide hybridizes under stringent conditions with a polynucleotide that encodes a polypeptide having the amino acid sequence selected from the group consisting of SEQ ID NO:4 and SEQ ID NO:5.
4. (Original) An isolated polynucleotide as claimed in claim 1, wherein said polynucleotide hybridizes under stringent conditions with a riboprobe that is the reverse transcript of a polynucleotide having the sequence of nucleotide 1514 through 1845 of SEQ ID NO:1.
5. (Original) An isolated polynucleotide as claimed in claim 1, wherein said polynucleotide hybridizes under stringent conditions with a riboprobe that is the reverse transcript of a polynucleotide having the sequence of nucleotide 1514 through 1845 of SEQ ID NO:1, wherein said hybridization is carried out in 5X SSPE, 5X Denhardt's, 0.5% DAD, 50% formamide, and 100 µg/ml yeast tRNA for about 15 to about 17 hours at about 68°C.
6. (Cancelled)

7. (Original) An isolated polynucleotide as claimed in claim 1, wherein said insect is a member of the order *Diptera* selected from the group consisting of horn fly, fruit fly, screwworm fly, blow fly, mosquito, Mediterranean fruit fly, biting midge, black fly, horse fly, deer fly, stable fly, leaf miner, housefly, bot fly, warble fly, tiger mosquito, swamp marsh mosquito, *Culex pipiens*, *Aedes aegypti*, and *Anopheles albopictus*.
8. (Original) An isolated polynucleotide of claim 7, wherein said polynucleotide has been isolated from a fruit fly.
9. (Currently amended) An isolated polynucleotide of claim 8, wherein said polynucleotide has a nucleotide sequence that encodes a polypeptide having an amino acid sequence selected from the group consisting of SEQ ID NO:34 and SEQ ID NO:45.
10. (Original) An isolated polynucleotide of claim 9, wherein said polynucleotide has a nucleotide sequence selected from the group consisting of SEQ ID NO:1 and SEQ ID NO:2.
11. (Original) An expression vector comprising the isolated polynucleotide of claim 1.
12. (Original) A cultured host cell comprising the expression vector of claim 11.
13. (Original) A host cell of claim 12, wherein said host cell is selected from the group consisting of bacterial cell, yeast cell, insect cell and mammalian cell.
14. (Original) A method of producing a polypeptide, said method comprising the steps of:
 - (a) culturing a host cell comprising the expression vector of claim 11, wherein said cultured host cell expresses said bHLH-Pas polypeptide, and
 - (b) isolating said polypeptide from said cultured host cell.

Claims 15-17 (Withdrawn)

18. (Original) A method for screening compounds that specifically bind with a bHLH-PAS/JHR polypeptide, comprising:
 - (a) incubating a test compound in a solution that comprises an isolated bHLH-PAS polypeptide, wherein said polypeptide is encoded by the polynucleotide of claim 1, and
 - (b) detecting the binding of said test compound with said polypeptide.

19. (Original) A method for screening compounds that specifically bind with a complex comprising a bHLH-PAS polypeptide that is involved in binding juvenile hormone III and a heteromultimeric partner of said polypeptide, comprising:
- (a) incubating a test compound in a solution that comprises an isolated bHLH-PAS polypeptide, and an isolated heteromultimeric partner of said polypeptide, wherein said polypeptide is encoded by the polynucleotide of claim 1, and
 - (b) detecting the binding of said test compound with said polypeptide.
20. (Original) The method of claim 18, wherein said test compound is detectably labeled.
21. (Original) The method of claim 20, wherein the binding of said test compound with said polypeptide is detected in step (b) using a scintillation proximity assay.
22. (Original) The method of claim 20, wherein said detectably labeled test compound comprises a detectable label selected from the group consisting of radiolabel, fluorescent label, chemiluminescent label, and bioluminescent label.
23. (Original) The method of claim 18, further comprising the step of incubating said bHLH-PAS polypeptide with a detectably labeled ligand, wherein said detectably labeled ligand is added to said solution containing said receptor at a time selected from the group consisting of
- (i) prior to step (a),
 - (ii) after step (a) and before step (b), and
 - (iii) concomitantly with the addition of said test compound.
24. (Original) The method of claim 18, wherein said detectably labeled ligand is juvenile hormone or a juvenile hormone analog, and wherein said detectable label is selected from the group consisting of radiolabel, fluorescent label, chemiluminescent label, and bioluminescent label.
25. (Original) The method of claim 24, wherein said detectably labeled juvenile hormone is [³H] 10R-juvenile hormone III.
26. (Original) The method of claim 24, wherein said detectably labeled juvenile hormone is [³H] methoprene.

27. (Original) The method of claim 18, further comprising the step of incubating said bHLH-PAS polypeptide with a detectably labeled photoaffinity analog of juvenile hormone after step (a) and before step (b).
28. (Original) The method of claim 18, wherein said bHLH-PAS polypeptide is selected from the group consisting of:
- (a) a conservative amino acid variant of SEQ ID NO:3,
 - (b) a functional fragment of a polypeptide having the amino acid sequence of SEQ ID NO:3,
 - (c) a polypeptide having an amino acid sequence of SEQ ID NO:3,
 - (d) a conservative amino acid variant of SEQ ID NO:4,
 - (e) a functional fragment of a polypeptide having the amino acid sequence of SEQ ID NO:4,
 - (f) a polypeptide having an amino acid sequence of SEQ ID NO:4, and
 - (g) a *Met*-JHR alternatively-spliced isoform.
29. (Original) A nucleic acid probe for detecting RFLPs in an insect population, wherein said RFLPs discriminate between JH-sensitive and JH-resistant individuals, said probe comprising a genetic locus in a gene encoding a bHLH-PAS polypeptide that is associated with JH analog sensitivity and resistance traits, and wherein said polypeptide is involved in binding juvenile hormone III.

Claims 30-41 (Withdrawn)

42. (Cancelled)

43. (Cancelled)

44. (Currently amended) An isolated polynucleotide which comprises the sequence of nucleotide 1 through nucleotide 1291 of SEQ ID NO:17.

45. (Currently amended) An isolated polynucleotide which comprises the sequence of nucleotide 1 through nucleotide 1513 of SEQ ID NO:17.

46. (Currently amended) An isolated polynucleotide which comprises the sequence of nucleotide 3733 through nucleotide 6235 of SEQ ID NO:17.

47. (Currently amended) An isolated polynucleotide which comprises the sequence of nucleotide 4302 through nucleotide 6235 of SEQ ID NO:17.

48. (Cancelled)

49. (Cancelled)

50. (Original) An isolated polynucleotide comprising the nucleotide sequence of SEQ ID NO:7.

51. (Currently amended) An isolated polynucleotide as claimed in claim 1, wherein said polynucleotide hybridizes under stringent conditions with a polynucleotide having a nucleotide sequence of SEQ ID NO:7, wherein the stringent conditions comprise hybridization in 1xSSC and 0.1% SDS at about 55°C for about 60 minutes.